

REMARKS

Reconsideration of this application is respectfully requested. By this amendment, claims 1 and 2 have been amended. Currently, claims 1-23 are pending in this application.

Rejection under 35 U.S.C. 112, second paragraph

Claim 1 was rejected under 35 U.S.C. 112, 2nd paragraph, as indefinite. Specifically, the Examiner appears to have taken the position that use of the two terms “isolation means” and “line circuit isolation means” is indefinite, as it is not clear later which isolation means is being referred to by recitation in line 6 of “the isolation means.” Applicants have amended claim 1 to use the terms “line circuit isolation means” and “power supply isolation means” to clarify the claim. This amendment does not narrow the claim but merely renames the claimed feature with a more distinguishable name. Claim 2 has been similarly amended. In view of these claim amendments, applicants respectfully request that this rejection be withdrawn.

Rejection under 35 U.S.C. 103

Claims 1 and 7-23 were rejected under 35 U.S.C. 103 as unpatentable over Hung (U.S. Patent No. 5,390,231) in view of Pistilli (U.S. Patent No. 5,539,820). This rejection is respectfully traversed in view of the amendments to the claims and the following arguments.

The Examiner has taken the position that Hung teaches a current sensing means (12) and a line circuit isolation means (contacts 14, relay 15) for selectively coupling the line circuit to the telephone subscriber line. The Examiner correctly states that Hung does not teach selectively coupling a power supply to the line circuit. The Examiner has taken the position, however, that

Hung teaches a digital control circuit that is configured to control the drive voltage (DV) and the voltages on the tip and ring lines (TV and RV) to provide a limited loop current during normal operation. Thus, the Examiner concludes that it would have been obvious to provide an isolation means, such as disclosed by Pistilli, for the power supply to selectively couple the power supply to the line circuit. Applicants respectfully disagree.

1. Both Hung and Pistilli fail to teach control means ... to decouple the power supply from the line circuit in response to a current ... exceeding a current threshold.

The Examiner has acknowledged that Hung does not teaches a means to decouple the power supply from the line current in response to an over current condition. The Examiner has taken the position, however, that Pistilli teaches a known isolation means and control means. Applicants respectfully submit that the “isolation means and control means” in Pistilli is configured to respond to over-voltage conditions, not over-current conditions as claimed.

Pistilli teaches a circuit for use in protecting against over-voltages on a subscriber line circuit. While Pistilli does provide a circuit that will temporarily remove the power supply from the line drive circuit in response to an over-voltage condition, Pistilli does not teach or suggest a means to do so in connection with an over-current condition. See abstract, (“A telephone line interface circuit... is protected against transient voltages...”), see also, col. 9, lines 17-28, (“a negative transient voltage at one of the points TP and RP results in triggering of the crowbar-type protection device 52”) (emphasis added).

Accordingly, Pistilli does not make up the deficiencies of Hung. Specifically, both Hung and Pistilli fail to teach or suggest control means for operating the isolation means to decouple the power supply from the line circuit in response to a current sensed by the current sensing means – Hung doesn’t disconnect the power at all and Pistilli only does so in response to an

over-voltage condition. Accordingly, applicants respectfully submit that the combination of Hung and Pistilli fails to render claim 1 obvious.

2. Combining Hung and Pistilli would not have been obvious given the problem applicant was trying to solve.

One of the stated objectives of this application is to provide “a voltage and current protection arrangement for a line circuit that takes advantage of the current limiting capability of electronic telephone sets under normal operating conditions.” (Page 3, lines 7-10). In the Summary of the Invention section applicants further state that the “use of the FET in saturation mode takes advantage of the fact that an electronic telephone set does not require current limiting to be provided by the line circuit under normal operation.” (page 3, lines 27-30)

The Examiner has taken the position that the digital control circuit 20 is used by Hung to control the drive voltage and tip and ring voltages. (See e.g., Col. 6, lines 17-23). Hung also uses the digital control circuit 20 in normal operation to monitor the loop current I_L to determine the hook state of a telephone connected via the telephone line circuit. In the off-hook state, the digital control circuit 20 is used to provided a limited loop current to the line circuit (Col. 6, lines 41-45).

The Examiner has concluded that because Hung uses a digital control circuit 20, that “one of ordinary skill would have been motivated to seek an interface circuit having an isolation means for selectively coupling a power supply to the line circuit, and control means for operating the isolation means embodiment in order to isolate and control of an actual working arrangement taught by Hung, et al..”

Applicants are unable to ascertain why this would have been obvious to a person of ordinary skill in the art. If a person was to set out to provide a line protection circuit for use with electronic telephone sets having native current limiting capabilities, the most natural thing is to simply remove the current control aspects from the previous circuit. Thus, if a person was starting with Hung, the most natural thing would be to remove the current limiting aspects associated with the digital control circuit 20. It is not clear, from the rejection, why a person of ordinary skill in the art would have also been motivated to replace this portion with circuitry that is designed to perform additional functionality, namely functionality associated with disconnecting the power supply from the line circuit.

Applicants discovered that it would be advantageous to decouple the power supply from the line circuit for a period of time where a current on the line circuit exceeded a particular threshold. This secondary power supply isolation aspect was added to a circuit similar to Hung's circuit, which utilizes relays 14 to isolate the circuit. By doing so, applicants discovered that it was possible to provide a voltage and current protection arrangement responsive to fault conditions of short duration that is capable of automatically resetting itself when the line voltage and current has returned to normal operating conditions. (See Page 3, lines 16-20).

The Examiner has cited Pistilli as an example of an isolation circuit that disconnects the power supply from the line circuit. As set forth above, applicants do not agree with this interpretation of Pistilli. However, even if the Examiner is correct, there still is no motivation to combine Hung and Pistilli. Specifically, it would not have been obvious to replace a portion of Hung's circuitry with circuitry that performs a different function, when the objective could have been achieved simply by removing that same portion of circuitry.

Merely finding two pieces of art that include two claimed features is not sufficient to render the claims obvious. There must also be some reason or motivation to select those two references and the features disclosed by the two references. See MPEP 2143.01, 8th Ed. p. 2100-124 (“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.”) See also MPEP 2143.01, 8th Ed. p. 2100-125 (“If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”).

Independent claim 1 recites control means for operating the power supply isolation means to decouple the power supply from the line circuit in response to a current sensed by the current sensing means exceeding a current threshold, and to recouple the power supply to the line circuit responsive to a predetermined time interval having passed. Since the combination of Hung and Pistilli fails to teach or suggest this feature, and because there is no motivation to make the combination in the first instance, applicants respectfully request that the rejection of claim 1 be withdrawn.

Independent claim 7 recites a method that includes the steps of disconnecting... the line circuit from the power supply, and reconnecting the line circuit to the power supply. Independent claims 11 and 16 contain limitations of a similar nature. Since the combination of Hung and Pistilli fails to teach or suggest this feature, and because there is no motivation to make the combination in the first instance, applicants respectfully request that the rejection of claims 7, 11, and 16 be withdrawn.

Rejection under 35 U.S.C. 103

Claims 2-6 were rejected under 35 U.S.C. 103 as unpatentable over Hung in view of Pistilli, and further in view of Chen et al. (U.S. Patent No. 6,288,883). Since claims 2-6 depend from claim 1, these claims are patentable for at least the same reasons set forth above.

Applicants note that Chen fails to make up the deficiencies noted above with respect to Hung and Pistilli. Specifically, at col. 2, lines 37-41, Chen states that “the power input protection circuit provides an active switch circuit that senses when an over-voltage or over-current condition has occurred and disconnects the power input lines when an over-voltage condition occurs and limits the flow of current when an over-current condition occurs.” (emphasis added). Thus, Chen fails to teach or suggest a circuit that disconnects the power supply from the line circuit in an over-current condition. Rather, Chen merely limits the flow of current during an over-current condition. Accordingly, applicants respectfully request that the rejection of claims 2-6 under 35 U.S.C. 103 be withdrawn.

Additionally, Chen does not teach several of the features specifically claimed in dependent claims 2-6. For example, with respect to claim 3, the Examiner has taken the position that it would have been obvious to swap the NPN transistor in Chen for a PNP transistor as claimed. Applicants respectfully disagree. While it might be possible to redesign a circuit to utilize a PNP transistor, it is not clear whether Chen’s circuit could be made to function utilizing a PNP transistor without significant modification and without affecting its functionality, as PNP and NPN transistors function in exactly opposite ways. Accordingly, applicants respectfully submit that claim 3 would not have been obvious in view of Chen’s teachings.

With respect to claim 4, the Examiner has taken the position that diode 16 in Chen is connected between the source of the FET Q102 and the gate of the FET Q102. Actually, the

diode 16 in Chen is connected between the drain of the FET Q102 and the gate of the FET Q102 (via resistors R 136, R133, and R 137). Thus, this claimed feature is not taught or suggested by Chen.

With respect to claim 5, the Examiner has taken the position that capacitor C125 is connected to the emitter of the PNP transistor (Q101) and to the drain of the FET Q102. Applicants respectfully disagree. The capacitor C125 is connected to via resistor R137 to the gate of FET Q102. The only path that connects the capacitor to the drain of the FET Q102 is via resistor R133, Resistor R136 and diode 16. The diode 16 effectively blocks this path to the drain of FET Q102. Thus, capacitor C125 cannot be considered to be connected to the drain of the FET Q102.

With respect to claim 6, the Examiner has taken the position that Chen teaches a resistor R133 that couples the emitter of the PNP transistor Q101 to the controller. The controller was identified earlier, on page 18 of the office action in connection with rejection of claim 2, and again on page 19 of the office action in connection with rejection of claim 3, as capacitor C125. As is clear in Fig. 3 of Chen, the resistor R133 is not connected between the emitter of Q101 and the capacitor C125.

In view of these several deficiencies in Chen, applicants respectfully request that the rejection of these claims be withdrawn.

Conclusion

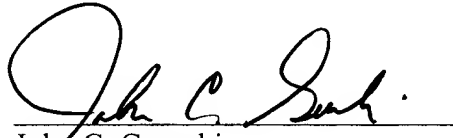
In view of foregoing claim amendments and remarks, it is respectfully submitted that the application is now in condition for allowance and an action to this effect is respectfully requested. If there are any questions or concerns regarding the amendments or these remarks,

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the Examiner is requested to telephone the undersigned at the telephone number listed below.

If any fees are due in connection with this filing, the Commissioner is hereby authorized to charge payment of the fees associated with this communication or credit any overpayment to Deposit Account No. 502246 (Ref: NN-RO3951).

Respectfully Submitted



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